Cariboo-Chilcotin
Land-Use Plan

Regional Biodiversity Conservation Strategy

UPDATE NOTE #4

An Approach for Patch Size Assessments in the Cariboo Forest Region

Prepared by:
Biodiversity Conservation Strategy Committee

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Cariboo Mid-Coast Interagency Management Committee

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Biodiversity Conservation Strategy Update Notes are prepared by the Cariboo-Chilcotin Biodiversity Conservation Strategy Committee for purposes of technical clarification or technical additions to the Biodiversity Conservation Strategy report, submitted to the Cariboo-Mid Coast Interagency Management Committee in July 1996. These notes are prepared in response to issues and questions presented to the Biodiversity Committee or recognized by the members of the Committee.

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An Approach for Patch Size Assessments in the Cariboo Forest Region

Introduction

Patch size and seral stage management are principal tools for conserving biodiversity on the landscape. Patch size and seral stage representation reflect the spatial and temporal patterns of landscape disturbances within which biodiversity is conserved or diminished. Together they largely determine whether unfragmented areas of mature and older forests will be maintained on the landscape.

Although a provincial approach for assessing the total area of each seral stage is relatively well described for B.C., a similar approach for assessing patch size representation has not been completed. Guidelines and targets for patch size representation in the Biodiversity Guidebook have been variously interpreted. As a result, a variety of patch size assessment approaches and interpretations have been used for planning purposes in the Cariboo Forest Region.

The purpose of this document is to describe a recommended approach for patch size assessments in the Cariboo Forest Region

The purpose of this document is to describe a recommended approach for all patch size assessments in the Cariboo Forest Region. This approach has been developed by the Biodiversity Conservation Strategy Committee and is consistent with the underlying principles of biodiversity conservation used for the Biodiversity Guidebook and Landscape Unit Planning Guide. It has been developed following review of the approach developed by Klenner and others[1] for the Kamloops Forest Region.

An additional purpose of this document is to describe the patch size maps and analysis tables that have been developed and distributed by the Biodiversity Committee and staff of the LIM Section of the Cariboo Forest Region (currently within the Ministry of Sustainable Resource Management).

The recommended approach is consistent with underlying assumptions of the Biodiversity Guidebook.

The approach described here is consistent with the underlying assumption of the Biodiversity Guidebook approach to biodiversity conservation. This assumption is that native species and ecological processes are more likely to be maintained if managed forests are made to resemble those created by natural disturbances. Spatial distribution of disturbances is one of the most important factors affecting the biodiversity characteristics of the landscape. Given a constant disturbance or harvest rate, large or aggregated disturbances result in relatively large patches of each seral stage including old forests while smaller or more dispersed disturbances result in small patches of each seral stage. Managing the landscape to resemble the natural distribution and sizes of seral stage patches is a major component of biodiversity conservation. Therefore, managing the total area of each seral stage (meeting seral stage percentage targets) must be combined with management of seral stage patch sizes in order to effectively reduce risks to biodiversity.

Objectives of Patch Size Assessments

Patch size assessment is a planning tool for evaluating whether the distribution of patch sizes within a landscape is sufficient to meet biodiversity conservation objectives. In addition, it is a tool for evaluating different harvesting distribution options for reducing risks to biodiversity. Patch size

[1] Klenner, W. 2000. Guiding principles and issues to consider in the development of aggregated harvest areas. Unpublished manuscript, Kamloops Forest Region, Ministry of Forests. Kamloops, B.C.

assessments provide the spatial component for maintenance of seral stages on the landscape. Patch size assessment allows the forest manager to distinguish a landscape where seral stages occur in a range of patch sizes, including large patches, from a landscape that has the same total area of each seral stage but where the they are fragmented into mostly small patches.

Although patch size assessments need to address all seral stages, the focus in the Biodiversity Strategy Committee approach is on moderate and large patches of older (mature and old seral stages) forests.

Although patch size assessments need to address all seral stages, the focus in this approach is on moderate and large patches of older (mature and old) forests.

Mature and old forests are given special attention since they have the greatest probability of being disturbed by harvesting or other agent and they require the greatest time for recruitment or recovery. Without attention to spatial distribution of older forests, the tendency is for older forests to be fragmented into small patches by timber harvesting. In the short-term, large areas of older forests can be maintained on the landscape by avoiding fragmentation of older patches through aggregated harvesting. In the longer term, moderate and large areas of older forests can be recruited by creating larger disturbances and by aggregating smaller disturbances.

Old growth management areas (OGMA's) are recognized in the Cariboo-Chilcotin as a principal mechanism for maintaining long-term representation of old forests on the landscape. Patch size management complements OGMA designation and management by distributing cutblocks to:

- maintain, whenever possible, moderate and large patches of older forests outside of OGMA's until forests within OGMA's become mostly old,
- maintain mature and mature+old forest patches on the landscape over the long-term, especially adjacent to OGMA's;
- maintain mature and old forests in larger patches whenever possible as future options for OGMA replacement and recruitment.

Definition of a Patch

General Definition and Types of Patches

The Biodiversity Strategy Committee defines a patch as an area of forest with uniform inventory age class or uniform seral stage, surrounded by forests that are either younger or older or by non-forest land cover types. No other criteria such as leading species or other inventory attributes are used to define a patch. The focus on only age or seral stage is consistent with the Biodiversity Guidebook and Landscape Unit Planning Guide.

A patch is an area of forest with uniform inventory age class or seral stage, surrounded by forests that are either younger or older or by non-forest.

In NDT 4, adjacent stands in the Pine Group and Fir Group do not form separate patches as long as they have the same age class or seral stage, after applying the different seral stage criteria for the two groups.

Two types of patches are identified: older forest patches and younger or recruitment forest patches (Table 1). Older forest patches are areas of uniform mature, mature+old, or old seral stage (based on age class in the forest inventory). In those NDT/BEC units where mature seral stage includes stands up to 250 years, mature seral stage forests have been subdivided into early mature (≤ 140 years) and older mature (141-250 years) patches on maps. Younger or recruitment forest patches are areas of uniform inventory age class, up to age class 6 or 101-120 years. Forests older than 120 years in all NDT/BEC units are either mature or old seral stage. Younger forest patches are also termed recruitment patches since they are potential recruitment to mature and old seral stage patches. The relative area of each of these younger patch types provides insights into the long-term potential recruitment of older forest patches and the long term dynamics of landscape patches.

Table 1. Patch Types

Patch Type	Definition
Older Forest Patches	
Old patches	Old seral stage forest surrounded by mature or younger forests
Mature+Old patches	Mature and/or old seral stage forests surrounded by younger forests
Mature patches	Mature seral stage forests surrounded by older or younger forests
Early mature patches	Mature seral stage forests ≤ 140 years old in NDT/BEC units where mature seral stage includes forests up to 250 years old (these subdivisions of mature patches are identified on maps but not in analytical summaries).
Late mature patches	Mature seral stage forests >140 years old in NDT/BEC units where mature seral stage includes forests up to 250 years (these subdivisions of mature patches are identified on maps but not in analytical summaries).
Younger (Recruitment) Forest Patches	Forest areas with uniform inventory age class surrounded by younger or older forests. Includes six patch types: • 0-20 year old forest patches; • 21-40 year old forest patches; • 41-60 year old forest patches; • 61-80 year old forest patches; • 81-100 year old forest patches; • 101-120 year old patches; (in those NDT/BEC units where forests of this age class are defined as mature, they are included as part of mature and mature+old patches and not as younger (recruitment) patches)

A variety of patch types have been identified in this approach in order to enhance the planning utility and power of patch size analyses. Assessing older (mature and old seral stage) forest patches separately allows the planner or other analyst to clearly identify the patch size condition of old and mature seral stages, the principal focus of the assessment. If older forest patches are not distinguished from younger patches, then the current condition of the landscape cannot be interpreted from the area of forest in each patch size category. For example, a given proportion of large patches (patches > 250 ha) on the landscape may all be younger forest, older forest, or a mix of the two.

Older and younger patches are assessed separately in order to address the principal objective of patch size assessments

The Biodiversity Committee did not consider it necessary to distinguish inventory age classes as different patch types within the seral stage patch types. That is, all areas of old seral stage forest are considered to provide old forest biodiversity services regardless of inventory age class. In NDT/BEC units where mature seral stage includes forests up to 140 years old, all mature seral stage forests are considered to provide mature seral stage services, regardless of age class. However, in NDT/BEC units where mature seral stage includes forests up to 250 years (often 100 - 250 years as in NDT1/ICH), early mature forests (up to 140 years) are considered to provide somewhat different biodiversity services than late mature forests (141-250 years). Early mature and late mature forests will also recruit to old forests within different time frames. Consequently, early and late mature seral forests are distinguished on patch size maps although not in patch data summaries.

Role of NDT/BEC and Landscape Unit Boundaries

An NDT or BEC unit boundary does not define a patch in this approach, given that the same seral stage or age class occurs on both sides of the boundary. A forest area with uniform age class or seral stage is a single patch even though an NDT or BEC unit boundary passes through it. As a result, a single patch may occur

An NDT or BEC unit boundary does not define a patch.

in two or more adjacent NDT/BEC units and the size of the patch is determined from its total area in all NDT/BEC units in which it occurs.

Patches do not cross landscape unit boundaries. The relatively large size of landscape units means that they can adequately represent the full range of target patch sizes and they should easily encompass most of the range of disturbance sizes, both natural and harvesting. In addition, landscape unit boundaries are used to define patches for reasons of practical application.

Forest Interior Patches

Maintenance of forest interior conditions within old and mature forest patches is important to biodiversity conservation. A transition environment is present within old forests near the boundary with younger forests. Old forest conditions are altered within this transition area. The transition conditions extend into the old forest for varying distances depending on the attribute measured and the degree of difference between the old forest and the adjacent younger forest. The transition conditions have negative effects on some species that depend on old growth conditions. An old forest patch that is narrow and entirely transitional to a younger patch has less value for old forest dependent species than a patch that is wider and includes interior areas inside the zone of transition. As a result, it is important to biodiversity conservation to maintain a proportion of old forests as forest interior.

This approach assesses interior forest within both old and mature+old forest patches, using a variable buffer width.

The Biodiversity Guidebook states that the transition environment in an old forest patch may extend up to 200 m into the old patch from an adjacent to a newly harvested area. The Guidebook recommends that old patches be a minimum of 600 m wide when it is a management objective to provide forest interior. This width will provide a core of 200 m of forest interior.

The Biodiversity Strategy Committee approach assesses the percentage of forest interior within both old forest patches and mature+old forest patches. A variable transition distance is used depending on the age of the patch adjacent to the old or mature+old patch. This variable transition assumes that the average width of the transition zone decreases, as the adjacent patch becomes more similar to the old or mature+old patch. For example, the transition width within an old forest patch is assumed to extend 200 m into the patch from a newly harvested area but only 50 m from a mature forest patch (Table 2).

Table 2. Buffer (transition) widths used to determine the area of interior forest in old and mature forest patches.

	Adjacent Patch					
Seral Stage of Patch	Mature	101-120 years	41-100 years	0-40 years	Non-productive	Lakes and large rivers
Old	50	50	100	200	100	100
Mature		50	100	200	100	100

As described below, the Biodiversity Guidebook contains targets for the proportion of the old forest area that is forest interior.

Forest interior is not buffered from NDT/BEC boundaries or landscape unit boundaries.

Merging of Small Polygons, Streams, and Roads into the Surrounding Patch

Single line watercourses on the forest inventory (FC1) maps are not patch boundaries, as long as the same seral stage or age class occurs on both sides of the watercourse. Double line watercourses and lakes do form patch boundaries.

Roads do not interrupt patches on the map or in the data summary in this approach. However, three categories of roads are shown on the maps: highways, public roads, and forest service roads. When planning or selecting the location of harvest blocks to maintain forest interior, the planner should consider the role of roads in breaking forest interior. Patches without roads may have highest forest interior values.

A lower limit was set on the size of an inventory polygon that would form a distinct patch within a mature or old forest. This was done in order to avoid reducing forest interior area due to the presence of small, natural gaps that could be considered part of the natural variability of the surrounding mature or old forest. Whether a polygon is merged or not into the surrounding patch depends on the size of the polygon and its seral stage. In practice, a buffer is placed around the small polygon using the buffer widths listed in Table 2. Small polygons are merged into the surrounding mature or old forest if the combined area of the small polygon and its buffer is less than 10 ha. As a result, no forest polygons < 40 years old are merged into a surrounding mature or old patch. Polygons that are 41-100 years old and non-forest polygons are merged with the surrounding patch if they are less than about 2 ha, and mature forest polygons are merged with an old patch if they are less than about 5 ha.

Comparisons with Biodiversity Guidebook and Landscape Unit Planning Guide Definitions
The Biodiversity Guidebook defines a patch as:

> "a stand of similar-aged forest that differs in age from adjacent patches by more than 20 years. When used in the design of landscape patterns, the term refers to the size of either a natural disturbance opening that led to even-aged forests or an opening created by cutblocks."

The Guidebook states that patch size targets apply to both harvest units and leave areas between the harvest units. Harvest units can be either a single cutblock or an aggregate of cutblocks. Patch size targets in the Guidebook are also stated to apply to the remaining mature forest stands.

The Landscape Unit Planning Guide defines a patch like the Biodiversity Guidebook, as " a stand of similar aged forest that differs in age from adjacent patches by more than 20 years." Patch size recommendations in the Planning Guide refer to "new harvesting and any harvested or disturbed areas 20 years or younger." For purposes of the Planning Guide, "[t]he patch size recommendations are implemented this way because the size and distribution of cutting units determines the size distribution of stands in the future."

The recommended approach is a refinement of the conceptual approach in the Biodiversity Guidebook and Landscape Unit Planning Guide.

The patch definitions in the Biodiversity Guidebook and the Landscape Unit Planning Guide focus on harvest blocks and other recent disturbances, although the Guidebook also refers to leave areas between the blocks. An underlying assumption of this focus is that if a range of harvest block sizes are created, the landscape will, over the long-term, support a range of patch sizes in all age classes, including mature forests. Creating a range of cutblock sizes is the principal long-term management tool for creating a range of mature and other patch sizes. In addition, creating large harvest blocks results in less fragmentation of the landscape, given a constant rate of harvest or other disturbance. Therefore, the Guidebook states that the "combination of seral stage distribution and harvest unit size recommendations are designed to ensure that some large, unfragmented mature forests are always present on the landscape."

The Biodiversity Guidebook definition of a patch as > 20 years older than adjacent patches would be difficult to apply in practice, except to recent harvest areas. The use of inventory age classes or seral stages often result in adjacent patches that are less than 20 years different in age but is practically much simpler to implement.

The Biodiversity Strategy Committee approach is a refinement of the conceptual approach described in the Biodiversity Guidebook and Landscape Unit Planning Guide. The patch size condition of mature and old forests is addressed more directly and the focus for implementation is expanded from harvest blocks to both harvest blocks and mature and old seral stages. The principal refinement in this approach is a more direct focus on short- and medium-term maintenance of larger patches of older forests. The Biodiversity Guidebook addresses maintenance of larger patches of older forests indirectly through a combination of seral stage percentage guidelines and patch size distribution guidelines. That is, the Guidebook states that "..the combination of seral stage distribution and harvest unit size recommendations are designed to ensure that some large, unfragmented mature forests are always present on the landscape." It is the opinion of the Biodiversity Strategy Committee that the indirect approach, even if fully achieved, will not ensure maintenance of larger patches of older forests in the short- or long-term. As a result, it is more appropriate to focus the assessment directly on larger patches of older forests as well as on harvest patches.

Unit of Patch Size Assessment

The unit of patch size assessment and target application is the NDT/BEC unit, the same unit that is used to apply seral stage percentage targets.

The unit of patch size assessment and target application is the NDT/BEC unit.

Since a single patch may extend across NDT/BEC unit boundaries, patch size assessments for one NDT/BEC unit often have to include the area of a patch in an adjacent NDT/BEC unit. This is illustrated on Figure 1. Within NDT1/ICH, there are three large (>250 ha) old patches that occur entirely within the landscape unit and at least partially within NDT1/ICH. All three patches qualify as large patches for purposes of patch size assessments in NDT1/ICH. However, only the area of the large patches that is entirely within NDT1/ICH is tallied in calculating the total area of large patches within unit. Thus, there are 650 ha of large patch within NDT1/ICH on the diagram. The area of old forest that extends beyond the landscape unit boundary is split into two patches by the boundary. The patch that is within the landscape unit is less than 250 ha and does not qualify as a large patch.

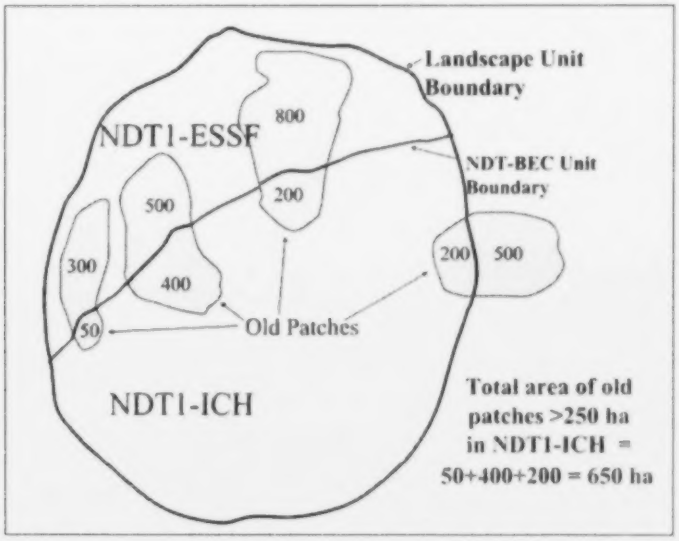


Figure 1. Schematic representation of old patches that cross a boundary between NDT/BEC units.

Since a single patch can occur on both sides of an NDT/BEC boundary, harvesting a portion of a patch in one NDT/BEC unit can influence the achievement of patch objectives in an adjacent unit.

Patch Guidelines

Patch Size Distribution

The Biodiversity Guidebook contains patch size distribution guidelines for each NDT and, in NDT 3 for subdivisions of the NDT based on the occurrence of Douglas-fir. These guidelines are contained in Table 3.

The Biodiversity Guidebook patch size targets apply to harvest blocks; they are a management tool for maintaining larger patches of older forests on the landscape.

The Biodiversity Strategy Committee considers these patch size targets to apply primarily to recent harvest blocks, either single cutblocks or aggregates of cutblocks. When viewed in the context of the principal focus of patch size assessments (maintaining larger patches of older forests), implementation of these targets is a management tool rather than a principal objective. Their value as a tool is that creation of larger harvest units will, in time, potentially provide recruitment for larger patches of older forests. In addition, in the shorter-term, creation of large or aggregated harvest units is a management tool to relieve harvesting pressure on remaining larger patches of older forests.

Table 3. Patch size distribution guidelines from the Biodiversity Guidebook

		Patch Size Class				
NDT	BEC unit	0-40 ha	41-80 ha	80-250 ha	40-250 ha	>250 ha
1	all	30-40	30-40	20-40	n/a	n/a
2	all	30-40	30-40	20-40	n/a	n/a
3 Douglas-fir throughout	SBSdw, SBSmh, SBSmw, ICHdk	20-30	25-40	30-50	n/a	n/a
3 Douglas-fir restricted	all others	10-20	n/a	n/a	10-20	60-80
4	all	30-40	30-40	20-30	n/a	n/a

According to the Guidebook, these guidelines refer to the percentage of recent (≤ 20 years) harvest unit area and leave area that is in each patch size class. A harvest unit may be a single cutblock or an aggregation of cutblocks. The target values represent a vision of the desired future condition of harvest block sizes and will not necessarily be achievable on initial harvest passes in a watershed.

Patch size targets in the Biodiversity Guidebook do not apply to older forests; the proportion of older forests in moderate and large patches should substantially exceed the targets for harvest blocks.

Application of the Guidebook patch size targets to mature and old forests is not considered appropriate by the Biodiversity Strategy Committee. These targets emulate to a reasonable degree the scale of natural disturbance regimes in each NDT. However, they do not reflect the natural patch sizes of older forests since these patch sizes are also dependent on frequency of disturbance or rate of harvest. In NDT 1 for example, the dominant scale of natural disturbance is small but patches of older forest are large since stand-initiating disturbances were infrequent. In NDT 3, the dominant scale of natural disturbances was much larger although patches of older forests are much smaller than in NDT 1 due to the high frequency of stand initiating disturbances. Compared to NDT 3, the patch size targets for NDT 1 include a small area of large patches (Table 3). That is, these targets emulate reasonably well the dominant size of natural disturbances but they do not appropriately reflect the size of remaining mature forest patches. As a result, it is not an

objective to reduce the sizes of older forests to target levels; patch size targets in the Biodiversity Guidebook to not apply to older forests.

A separate patch size assessment for older and younger patch types allows the guidelines to be focused on harvest units.

Forest Interior Guidelines

The interior forest guidelines contained in the Biodiversity Guidebook were used in this patch size assessment approach. The guidelines apply to the percent of old seral stage forest that is forest interior and vary according to NDT and Biodiversity Emphasis Option as shown in Table 4. Forest interior was assessed for both old and mature+old patches, using the buffer widths in Table 3.

Although there are no guidelines for mature+old forest interior in the Biodiversity Guidebook, they are assessed as a planning tool. Conservation of mature+old forest interior should be a management goal when possible, especially when old forest interior is limited. In addition, when evaluating whether or not old forest interior targets are met, it must be recalled that the Cariboo-Chilcotin Biodiversity Strategy considers that a proportion of the mature forest in all NDT's is old forest. An adjustment was applied to the inventory to indicate this. Since an inventory adjustment cannot be applied to individual patches, it has not been used in the patch size assessment approach. As a result, the proportion of old forest interior indicated by the assessment **may** underestimate the expected proportion of old forest interior, especially in BEC units where old is defined as greater than 250 years. In these cases, the mature+old forest interior provides another goalpost and the actual proportion of old forest interior may be between the assessed old forest interior and the assessed mature+old forest interior.

Table 4. Forest interior guidelines in the Biodiversity Guidebook. Values in the table are percentages of the total area of old forest that is interior old forest

NDT	Biodiversity Emphasis Option	
	Low	Intermediate or Higher
1	25	50
2	10	25
3	10	25
4	25	50

Treatment of Unharvested 'Category A' Blocks

The patch size assessment maps and tables treat approved Category A blocks as harvested with and assigned age class of 1 (0-20 years old). Proposed Category A blocks are not treated as harvested.

Description of Patch Size Maps for the Cariboo Forest Region

Patch size maps have been prepared in digital form for all landscape units in the Cariboo Forest Region by the Cariboo Forest Region LIM Section (now MSRM) and the Biodiversity Strategy Committee. These maps show the occurrence of each of the patch types listed in Table 1. The patch types are color themed to visually suggest increasing age (light to dark) and to aid in grouping patches into seral stages. Early seral stage (0-40 years) patches are yellow, immature seral stage (41-100 years) patches are orange to brown, mature seral stage patches are light green, and old seral stage patches are dark green.

Interior mature+old and old forest are indicated on the map by hatching. Mature forest interior is indicated by single, horizontal hatching while old forest interior is indicated by cross hatching.

Within NDT 4, mature and old inventory polygons in the Fir Group are stippled while those in the Pine Group are not stippled.

The maps show approved Category A blocks, where this information has been provided in digital form by Forest District staff. These blocks are placed within the 0-20 year age class.

Polygons that have a logging history indicated in the inventory data base (FIP files) and are listed as older than 80 years, are outlined separately on the maps. This was done to separate older blocks that have been logged from those that have not, according to forest inventory data.

Private land has been excluded from the patch size analysis and the patch maps.

Description of Patch Size Assessment Tables for the Cariboo Forest Region

A patch size data table has been produced for each NDT/BEC unit of each landscape unit in the Cariboo Forest Region. Each data table contains four blocks of data and three graphs. The contents of each of these is data blocks and graphs is summarized below.

Data Block 1 – Setting
Block 1 provides background data on the NDT/BEC unit.

	Area (ha)	*Logged*	*%Logged*
Total BEC Area	27549	4437	16
Crown Forest Area (CFA)	15437	4437	29
Productive Forest Area (PFA)	14780	4406	30
Fir Group (NDT4)	0	0	
Pine Group (NDT4)	0	0	
Biodiversity Emphasis Option	I		

Crown forest area is defined the same as "total forest area" and productive forest area is defined the same as "productive forest land base" in Appendix X of the Cariboo-Chilcotin Land Use Plan Integration Report (1998). Crown forest area includes parks and other public lands that are not included in the timber harvesting land base. Fir Group and Pine Group are defined in Biodiversity Strategy Committee Update Note #3.

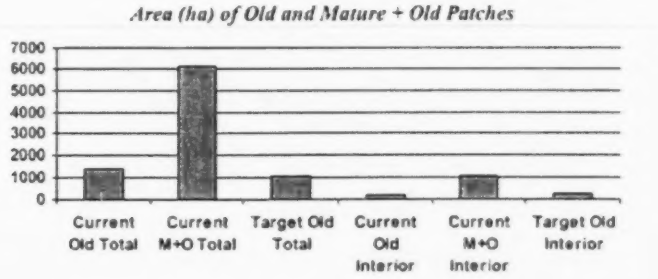
Data Block 2 – Current and Target Seral Stage Areas.
Block 2 contains current and target areas of old and mature+old seral stages, current and target area of interior old forest, and the current area of mature+old interior forest. Since an inventory adjustment has not been applied to the area of old forests, current areas may be lower than expected to be present. However, the current mature+old interior forest should be substantially larger than the target interior old forest. If it is not, the area of old forest interior is clearly below targets for biodiversity conservation. In this case, efforts should be made to retain existing large patches of older forests and to plan for recruitment of large patches of older forests.

Current and Target Seral Stage Areas

	Total			Interior		
	Current	Target		Current	Target	
		%	ha		%	ha
Old -Total	1439	7	1081	210	25	270
Old -Fir Group	0	0	0			
Old -Pine Group	0	0	0			
Mat+Old -Total	6133	17	2624	1057		
Mat+Old -Fir Group	0	0	0			
Mat+Old -Pine Group	0	0	0			

Graph 1 – Area of Old and Mature+Old Patches

This graph visually displays information contained in Block 2. It visually displays differences between the current area of older forest patches (total area and forest interior area) and the target areas of old forest patches.



Data Block 3 – Current Patch Size Representation by Age Class

Block 3 provides the area of each patch type (except early mature and late mature which are included only on the maps) in each of five patch size classes. The percent of each patch type in each size class can be compared to targets (Block 4) The percentages in the 0-20 year patch type should meet patch size distribution targets. The percentage of older forests in patches > 80 ha should substantially exceed targets. The proportion of younger (recruitment) patch types in each patch size category provides insights into potential long-term trends in the patch size distribution of older forests.

Current Patch Size Representation by Age Class

	Totals	0-40 ha		41-80 ha		81-250 ha		251-1000 ha		> 1000 ha	
Age Class	Area (ha)	ha	%	ha	%	ha	%	ha	%	ha	%
Old	1439	787	55	270	19	382	27	0		0	
Mat + Old	6133	1340	22	757	12	1974	32	1852	30	211	3
Mature	4695	1037	22	527	11	1384	29	1536	33	211	4
101 - 120 yrs*	0	0		0		0		0		0	
81 - 100 yrs	2148	1072	50	305	14	606	28	165	8	0	
61 - 80 yrs	1345	776	58	441	33	128	10	0		0	
41 - 60 yrs	2281	1235	54	103	5	660	29	283	12	0	
21 - 40 yrs	1330	743	56	355	27	233	18	0		0	
0 - 20 yrs	2200	1065	48	582	26	552	25	0		0	

* Patches 101-120 years are included within mature where mature is defined as 101-140 years or 101-250 years.

Data Block 4 – Patch Size Targets

These targets apply particularly to recent clearcut harvest blocks (0-20 year patch type). The distribution of the 0-20 year patch type by size class should meet these targets, except in NDT 4 where the 0-20 year patch type mostly reflects harvesting in the Pine Group. The percentage of mature and old forests in patch sizes > 80 ha should, as general guidance, substantially exceed the targets for harvest blocks.

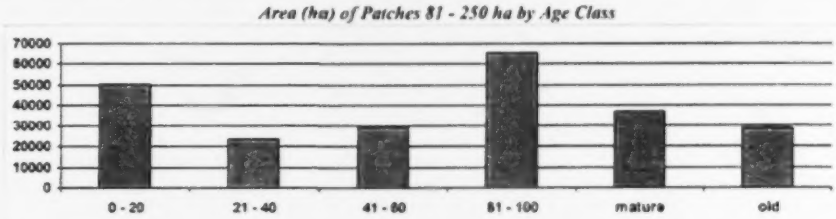
The patch size classes in this table vary by NDT/BEC unit according to the Biodiversity Guidebook.

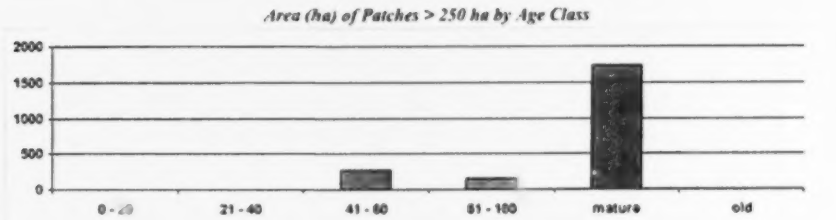
Patch Size Targets (0 to 20 year patches)

Patch Size	0-40 ha	41-250 ha	>250 ha
Percent	10 t 20	10 t 20	60 t 80
Target Area (ha)	220 t 440	220 t 440	1320 t 1760

Graphs 2 and 3 – Area of Patches 81-250 ha and > 250 ha by Age Class

These graphs display information contained in Data Block 3 on the representation of larger patch sizes within age classes. The relative heights of the bars in each graph indicate potential long-term trends in the recruitment of larger (>80 ha) mature and old patches.





Using the Patch Size Maps and Assessment Tables

Patch size maps and assessment tables are tools for selecting and justifying a distribution of harvest units that it is most appropriate for biodiversity conservation. Neither the map nor the tables provide solutions but they provide the basis for making informed decisions regarding the biodiversity implications of a particular harvest block distribution. The insights and experience of the forest development planner significantly enhance effective use of the maps and analysis tables.

Patch size maps and assessment tables are tools for selecting and justifying a harvest block distribution that is most appropriate for biodiversity conservation.

The tables provide quantitative assessments of how well the current landscape meets patch size targets. It must be appreciated however that reliability of these assessments are limited by the accuracy of the

inventory database and the ability of the inventory data to describe seral stage. The analysis tables serve primarily to quantitatively identify a patch size issue than can then be addressed through other tools, especially the patch size maps.

The patch size maps are the most useful tool for planning the distribution of harvest blocks and for evaluating options for avoiding fragmentation of large patches of older forests. The maps provide spatial information not contained in the assessment tables. The value of the maps will be significantly enhanced by the users familiarity with the landscape.

A principal purpose of the patch size analysis and maps is to identify the need for aggregating harvest blocks. The Biodiversity Strategy Committee plans to prepare an applications guide for using the patch size maps and analysis tables that will address guidelines for aggregated harvesting. In the meantime however, some preliminary guidelines can be listed. Aggregated harvesting should be considered when dispersed harvesting will threaten the presence of an adequate area of large patches of mature and old forests. For example, aggregated harvesting should be considered when:

- the size distribution of 0-20 year old patches is substantially skewed to small patches and few large patches are present, compared to targets;
- the total area of old forest interior is near or below targets and dispersed harvesting will further reduce this area;
- the total area of large (>80 ha) patches of older forests is not substantially greater than patch size targets and dispersed harvesting will further reduce the area of these patches.
- the average proportion of large patches in the 0-20 year old and 21-40 year old patch types is near or below patch size targets.